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Aerogel preparation by a rapid supercritical extraction process*

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Normal supercritical drying of aerogels requires time-sensitive steps (and patience), usually requiring ten or more hours to complete the entire process. It is possible to reduce the time to make aerogels that are prepared from alkoxide precursors to less than 60 minutes, start-to-finish. We describe such a process that involves injecting the precursor fluids directly into a mold and rapidly heating the mold under hydrostatic pressure provided by the expanding liquid. The gel forms during the heat-pressure cycle. Decompression is accomplished rapidly and the aerogel is evacuated while cooling. Details of the process will be presented, as well as data comparing the properties of the monolithic aerogels produced by this method, with conventional aerogels.

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